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THE PLANT DISEASE REPORTER

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Issued By

Division of Mycology and Disease Survey

Volume XXII Number 11

June 15, 1938

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XXII Number 11

June 15, 1938

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DISEASES OF FRUIT AND VEGETABLES ON THE NEW YORK MARKET DURING JANUARY, FEBRUARY, MARCH, AND APRIL, 1938 1/

James S. Wiant and C. O. Bratley

APPLES:

Injury from washing solutions was seen somewhat less frequently than last season. In only two cases noted was it of importance. In January a car of Delicious from Washington contained 18 percent of the fruit affected with injury in the calyx cavity. A shipment of Albemarle Pippin variety from Virginia had about 15 percent of the fruit with injury in calyx or stem cavity.

Internal breakdown (physiological) that in some respects resembled soggy breakdown (physiological) as well, was found in 4 cars of Twenty Ounce variety apples. The fruit, grown in New York State, had been shipped immediately after picking to various New York City cold storage houses. By early January 80 to 95 percent of the fruits in all lots were broken down.

Sporotrichum rot (Sporotrichum sp.) was found affecting from 1 to 3 percent of the apples of York and Winesap varieties in several shipments from Virginia.

More complaints have been received from dealers this season than in any recent season regarding poor control of scald (physiological). Receivers in England have reported some shipments of Virginia and New York apples as being severely affected. Too few lots of the apples showing scald, from these States have been seen to justify a comparison with previous years. Several of the lots examined were packed with less than recommended amounts of shredded oil paper.

During February, March, and April several shipments of Rome Beauty apples from Pennsylvania, New York, and Washington exhibited a peculiar spotting around the lenticels. The spots were brownish-gray on blushed areas and greenish-gray on non-blushed areas. They were otherwise similar to Jonathan spot (physiological) on Jonathan apples. Twenty percent of the fruits in some of the lots were affected.

1/ Reports on diseases of fruits and vegetables on the Chicago and New York markets in 1937, by G. B. Ramsey and by C. O. Bratley and James S. Wiant, respectively, will appear soon as Supplement 106.

ASPARAGUS:

During the latter part of March heavy losses from a decay caused by a species of Phytophthora were observed in certain carlots of California asparagus. The decay was likewise found, in small amounts, scattered through shipments arriving during April. The lesions were usually located on the basal third of the stalks. Affected tissues were water-soaked and soft. The decay advanced rapidly following removal of the asparagus from refrigerator cars.

Two shipments of Argentine asparagus examined during January arrived in very poor condition. The cut ends of the stalks in one shipment had been dipped to a depth of about 3/4 inch in melted paraffin. This had to a large extent cracked off by the time of arrival. Approximately 90 percent of the stalks in a major portion of the shipment were affected with decay caused by Penicillium sp. The decay was found both at the butts and at the bud scales along the sides of the stalks. Approximately 85 percent of the stalks in half of a later shipment were similarly decayed. These had not been dipped in wax.

Hawaiian asparagus which arrived in limited quantities during the early weeks of the year was for the most part in excellent condition.

CELERY:

Observations made during the present season suggest that late blight (Septoria apii-graveolentis) was more serious than usual in California celery arriving on the market. In many crates examined, nearly all of the leaves were completely covered with lesions so that they were shriveled and dry. Accompanying this was a severe blighting of the outer leaf stalk with lesions covering much of the outer surface of some stalks.

ORANGES:

During January and February only an occasional lot of mid-season oranges showed skin breakdown or pitting. In March and April "color added" oranges were received in increasing proportion. With this change there was an increase in skin breakdown. Examination of representative oranges from all cars offered during several days in April revealed that about one-fourth of the lots contained from 10 to 50 percent of the fruit severely affected. An occasional lot of natural-color fruit showed small amounts of the trouble. Decay in the form of stem-end rot (Diplodia natalensis and Phomopsis citri) was found affecting 2 to 3 percent of the oranges in a few lots but did not compare in importance with skin breakdown.

PEARS:

From 4 to 12 percent of the pears in six carlots of California Boscs were found affected with cladosporium rot. The decay occurred in the form of small, circular, sunken, brown spots centering at skin punctures. The diseased tissue was black, fairly dry, and readily separable from the healthy flesh. Only slight enlargement of the lesions took place in 5 days at room temperature.

Bullseye rot (Gloeosporium perennans and Neofabraea malicorticis) was found affecting an occasional pear of the Bosc, Anjou, and Winter Nelis varieties in carlot shipments from the two largest shipping sections in Oregon during March and April.

In mid-February, 5 and 15 percent respectively of the pears in two carlots of Oregon Anjous were found affected with internal breakdown (physiological). Three shipments of Williams (Bartlett) pears arriving from Argentina during March had 10, 8, and 4 percent respectively of the same trouble. Thirty-five percent of a shipment of the same variety from Chile was likewise affected. Fifteen percent of the pears in a carlot of domestic Boscs stored until March was affected with internal breakdown and scald.

Gray mold rot (Botrytis cinerea) is becoming of less importance each year. In both Eastern and Western grown pears an occasional fruit was affected but except for one car of Bosc showing 20 percent, no shipment seen contained more than 1 percent of the decay.

Scab (Venturia pyrina) was much more serious this season on Oregon pears than noted in previous years. A few cars of Anjous were observed in which at least 10 percent of the fruits bore several small sunken scab spots. The Winter Nelis variety was more severely affected than any other variety. In many cars of Winter Nelis that arrived in April, 50 percent of the fruit exhibited from 1 to 20 very small jet-black shiny spots. Judging from the history of scab spots of similar appearance on apples, it is quite probable that many of these lesions on the pears were not visible at time of packing. Scab was not seen on pears of the Bosc variety, and to only a limited extent last fall on Bartletts.

Injury from washing solution for spray residue removal was seen very rarely on pears. In only 4 cars, all of the Anjou variety from one packing house, was it of importance. From 50 to 70 percent of the fruits in these cars bore many scattered bleached spots the size of a pin-head or smaller, centering at lenticels.

PINEAPPLES:

Black rot (Thielaviopsis paradoxa) was found in the usual amounts in early season Puerto Rican shipments of the Red Spanish variety. Most lots had from 1 to 3 percent of the fruit affected, but an occasional lot contained 5 percent decay.

Cracking and gumming between basal eyes of the fruits were again found on early season Red Spanish pineapples. Cavities formed were lined in practically all cases by decay from which a Fusarium was isolated. An average of from 20 to 30 percent of all Red Spanish variety that arrived during March and April bore from 1 to 3 affected areas. Since the decay progressed slowly and affected so little tissue, unless fruit contained several cavities each, it was usually not discriminated against by the buyers. This trouble was by far the most important one on pineapples this spring and was about as prevalent as it was in March and April of 1937. Again Cabezonas variety pineapple fruit was not affected.

POTATOES:

Although bacterial soft rot was found in amounts as high as 15 and 20 percent in several shipments, for the most part little decay was found in the Bliss Triumph crop arriving from southern Florida during the present season. This is in marked contrast with the condition observed during the two preceding seasons.

A high percentage of the tubers resting on the floor racks were found injured by transit bruising in a few carlots of Idaho potatoes. The increased use of heavy paper underneath the sacks appears to be reducing the amount of this trouble.

Occasional lots of Maine potatoes have had a small percentage of the tubers affected with the new bacterial wilt and soft rot disease (undet.).

SPINACH:

White rust [Albugo occidentalis] was again found in limited amounts in many carlots of Texas spinach.

(Division of Fruit and Vegetable Crops and Diseases).

SPINACH AND ONION DISEASES IN THE WINTER GARDEN REGION OF TEXAS

S. S. Ivanoff

Spinach and onions are the two major crops grown in the Winter Garden region of Texas. This region, which includes five counties in Southwest Texas, southwest of San Antonio, is characterized by a relatively warm and dry climate. The area seeded to spinach in this region is quite large, representing about one-half of the area devoted to market spinach in the United States. About 15 percent of the onions produced in Texas are grown in this region. Spinach is sown in the fall and harvested in January and February. Onions, also fall-sown, mature in May.

By far the most destructive disease on spinach during the past season was white rust. The disease has been known to the growers for the last few years but until last year it had not caused great damage. This year every spinach field examined had the disease, in many cases the infection ran up to 100 percent, and in a few cases the plants were so severely damaged that the fields were not harvested. It is difficult to estimate the actual damage done to the entire crop but it is safe to say that the average yield was reduced by more than 25 percent. Of the two principal varieties commercially grown, Bloomsdale Long-standing (savoyed), and Viroflay (flat leaf), the last named variety was markedly less damaged than the savoyed variety. About 150 different varieties and strains of spinach collected from various parts of the world were grown on the experimental plots at the Winter Garden Substation and on private farms in cooperation with local growers. All plants of all the varieties and strains became infected, some very severely. The varieties Prickly Winter, Viroflay Reselected, and Tempo seemed promising from the standpoint of the disease and certain commercial qualities, including yield.

The identity of the white rust pathogen has been somewhat of a problem. Until recently in the absence of oospores, the fungus has been tentatively identified as Albugo occidentalis Wilson[1/], originally described on Blitum capitatum L. Lately the writer has found the sexual spores of the pathogen occurring in abundance in the tissue of old infected leaves and petioles. The oospores seemed indistinguishable from those found in B. capitatum. This fact should render the identification of the pathogen more positive.

1/ Wiant, James S. White rust of Texas spinach. Plant Disease Reporter 21: 114-115. 1937.

Two other diseases were destructive to spinach this year, downy mildew (Peronospora effusa (Grev.) Ces.) and curly top (virus). The crop is often able to recover from the downy mildew when it occurs at the early stage of the plant's growth as was the case this year in most fields. However, in some exceptional cases the damage to the crop reached about 30 percent.

Curly top began to appear in November, soon after some of the crop was planted and continued to appear on old and new plantings up to the end of the season. The vector Eutettix tenellus Baker was present in small numbers throughout the season. An area of about four acres of spinach was destroyed almost entirely by this disease during the month of December, but the damage was light to the crop as a whole.

The two outstanding diseases on onions this past season were "onion blight" (cause undetermined) and pink root (reported variously as caused by Fusarium spp. and by Phoma terrestris Hansen).

"Onion blight" or "onion wilt", as called by local growers, is a disease on seed bed onions grown extensively in this region during the winter for shipment in early spring. The disease is expressed by rapid wilting of the leaf tips followed by necrosis, and by numerous small whitish spots all over the leaf. In time the affected leaves may wither and die. In addition, the lower portion of the plant, near the root plate, becomes dry and flaccid. This season the disease was widely prevalent and destructive to the crop. In many large fields every plant seemed affected, and the number of harvestable plants was reduced by 10 to 20 percent. The actual loss to the grower is even greater on account of the low quality of the plants harvested. The disease seems to be favored by wet weather followed by dry, hot weather. Hyphae of Macrosporium and Thyrospora spp. have been found penetrating the infected tissue, but these fungi are not considered to be the cause of the trouble. The etiology of this disease is being studied.

Pink root on Bermuda onions affected all or nearly all plants in a few fields while in many other fields there was only a trace of it. The disease in certain areas was aggravated by heavy infestation of onion thrips. In two badly infected fields hundreds of thousands of onion bulbs were examined at the time of harvesting and only relatively few were found nearly free (but not entirely free) of pink root.

Mycelial wefts and sclerotia of Sclerotium rolfsii Sacc. were found on onion bulbs in two fields of light sandy soil a few days after a heavy rain. The damage was slight. Other common diseases, like Macrosporium leaf spot, and others, were present but were of economic importance only in isolated places.

(Texas Agricultural Experiment Station Substation No. 19).

EARLY APPEARANCE OF POTATO LATE BLIGHT IN VARIOUS STATES

LONG ISLAND, NEW YORK: In Suffolk County, Cobbler and Green Mountain potatoes are beginning to blossom. Growth has been very rapid and plants are tender. As a result of favorable weather during past weeks some blight infection has taken place. This week we are having warmer drier weather, which undoubtedly will check further infection, but such conditions are hard on tender growth. (H. C. Huckett, Weekly News Letter, June 13).

VIRGINIA: Specimens of potato vines affected with late blight (Phytophthora infestans) have been received from Princess Anne and Accomac Counties. In most cases it is not widespread, but in one 17-acre field in Princess Anne County the tops have nearly all been killed. Rain was frequent and 54 percent above normal in April and May and the temperature was from 1 to 14° below normal on 15 days during the latter month. This is the first time the writer has seen late blight on spring crops in this section. (Harold T. Cook, June 6, Virginia Truck Experiment Station).

TENNESSEE: We have a report of late blight of potatoes destroying a field by the thirtieth of May. This is the first time such a condition has been noted on the early crop here. (J. O. Andes, June 3, Tennessee Agricultural Experiment Station).

REPORTS ON VIRUS DISEASES OF POTATO

The following reports are of special interest from the standpoint of seed certification.

POTATO MOSAIC ON LONG ISLAND (Reports from Weekly News Letter, June 6): In Suffolk County a high amount of mosaic has been showing up on the Green Mountains grown from certified seed. One field on actual count showed 22 percent mosaic while 6 other fields examined showed from 12 to 15 percent. Such seed comes from both up-state and Maine sources. (J. B. Skaptason).

Potato mosaic is showing up in rather high percentages in some fields in Nassau County. Many growers are dissatisfied with the quality of seed this year. I was forced to change one of my projects to a new field because of mosaic appearing within the last week to the extent of 54 percent. (J. O. Nottingham).

LEAF CURL IN SOUTHEASTERN VIRGINIA: Leaf curl is more prevalent than usual this year. A survey of Princess Anne, Norfolk, and Nansemond Counties with the aid of Mr. H. M. Clark, showed that leaf curl ranging

from a trace to 75 percent was present in 9 out of 10 fields grown from Maine certified seed, while no leaf roll was found in the 4 fields grown from Canadian certified seed. (Harold T. Cook, June 6, Virginia Truck Experiment Station).

VEGETABLE DISEASES IN TIDEWATER VIRGINIA

Harold T. Cook

Potato: Late blight. (See page 196).

Early blight (Alternaria solani) is spreading rapidly and will probably cause some damage to the late potatoes.

Black leg (Bacillus phytophthorus). From 4 to 10 percent black-leg infected plants are present this year in fields of potatoes grown from Maine certified seed. Above-normal precipitation in April and May have favored the development of this disease.

Leaf curl (virus). (See page 196).

Celery: Early blight (Cercospora apii) of celery has been present to a slight extent in all of the hot bed plantings in Norfolk County for the last month, but has not spread sufficiently to be of economic importance.

Late blight (Septoria apii) has been found in one bed of hot bed celery in Norfolk County. This is the first time this disease has been observed here in the last eight years. Low temperatures and above-normal rainfall in April and May probably favored its development.

Snap beans: Halo blight (Phytomonas [Bacterium] medicaginis phaseolicola) is unusually abundant and destructive on snap beans this spring. Blight is present in about 65 percent of the bean fields in Eastern Virginia and infection and losses in individual fields range from a trace to 100 percent. The total yield for this area has been reduced about 30 percent by the disease. Low temperatures, heavy rains, and wind have favored the development and spread of blight.

Some fields are entirely free of blight which indicates that the disease is probably largely seed-borne.

(Virginia Truck Experiment Station, June 6).

OTHER REPORTS ON VEGETABLE DISEASES

TOMATO AND BEAN DISEASES IN GEORGIA: A survey of about 30 tomato fields in Evans and Tattnall Counties showed a crop remarkably free from diseases. This is undoubtedly partly due to the dry weather for the past three weeks. A part of a 10-acre field in Tattnall County showed 10 percent of the plants affected with fusarium wilt [F. bulbigenum lycopersici]. Slight nematode injury [Heterodera marioni] was also observed.

In Evans County common mosaic was observed on field beans, and in one field several plants were affected by Rhizoctonia.

A bean field in Chatham County, near Savannah, was badly affected with halo blight. All plants in an area of about 25 feet in diameter were either dead or badly blighted. (S. B. Fenne, Extension Plant Pathologist, May).

TRUCK CROP DISEASES REPORTED FROM NEW YORK (reports from Weekly News Letter for dates indicated): Mosaic and root rot of peas on Long Island. In Nassau County pea mosaic ranges in severity from about 20 to 90 percent infection, and rhizoctonia root rot [R. solani] has aided mosaic in completely killing rather large areas in some pea fields. (Orson S. Cannon, June 13).

Tomato diseases. In Monroe County alternaria blight has been very abundant on a few lots of tomato plants; considerable acreages of these plants have been set. Some nematode has been reported on tomatoes of southern plant origin and we have advised receivers of such plants to turn them down. (Ralph G. Palmer, June 6).

Some bacterial canker [Aplanobacter michiganense] is evident in tomato plants in Orleans County. (A. G. West, June 13).

Downy mildew of spinach on Long Island. In Nassau County downy mildew [Peronospora effusa] has made the susceptible varieties of spinach unmarketable. (L. Pyenson, June 6).

Leaf blight of carrots in Nassau County. Cercospora leaf blight [C. apii carotae] was found on June 6 in one field of carrots, and since then has been found in one other field, causing decided retardation of growth and killing of older leaves. (Orson S. Cannon, June 13).

PEACH LEAF CURL IN ILLINOIS

G. H. Boewe

Data showing the incidence of peach leaf curl, Exoascus deformans [Taphrina deformans], have been obtained by examining 79 plantings of various sizes in 27 counties in the southern half of the State. These data are given in the accompanying table. The field work was done at various times during a 6-week period beginning April 12 and ending May 21. In each orchard the disease had developed to full epidemic proportions at the time the examination was made.

In the main, wherever dormant treatment for leaf curl was given the disease was either absent or present in only very small amounts. There were, however, three exceptions. In an orchard in Gallatin County, sprayed with a barrel sprayer after the buds had opened and the green tips of leaves were just showing, nearly 8 percent of the leaves were diseased. The owners of orchard number 3 in Pulaski County and of orchard number 6 in Marion County stated that dormant sprays had been applied but did not know what spray materials were used. In the first nearly 2 percent and in the second about 21 percent of the leaves were attacked.

There was, however, considerable variation in the amount of leaf curl in orchards known to have had no dormant spray. There appears to be no adequate explanation for the absence of leaf curl or for the very light infection found in certain unsprayed plantings.

Incidence of leaf curl, Exoascus deformans, on peach in Illinois, 1938.

County	Control Used	Number of Trees in Orchard	Percentage of Trees with Infection	Percentage of Leaves Infected on Diseased Trees	Average Percentage of Leaves Diseased in Orchard
Bond	Oil and Bordeaux	450	0	0	0
Bond	Oil and Bordeaux	600	0	0	0
Christian	None	20	100	19.1	19.1
Clay	Not determined	4,000	0	0	0
Cumberland	Not determined	150	95	T	T
Edwards	None	10	70	6.7	4.69
Fayette	Probably none	500	100	4.2	4.2
Franklin	Oil and Bordeaux	1,000	0	0	0
Franklin	Not determined	2,000	1	T	T
Gallatin	Lime sulfur	850	100	7.9	7.9
Jackson	None	750	10	T	T
Jackson	None	9	22.22	T	T
Jackson	None	11	45.45	T	T

County	Control Used	Number of Trees in Orchard	Percentage of Trees with Infection	Percentage of Leaves Infected on Diseased Trees	Average Percentage of Leaves Diseased in orchard
Jackson	None	3,000	100	8.9	8.9
Jasper	Not determined	1,000	100	3.0	3.0
Jefferson	Oil and Bordeaux	600	0	0	0
Jefferson	Lime sulfur	750	0	0	0
Jefferson	None	6,000	100	2.05	2.05
Jefferson	None	500	100	0.1	0.1
Jefferson	None	2,000	0	0	0
Johnson	None	1,000	98	0.3	2.94
Johnson	Lime sulfur	1,500	0	0	0
Johnson	None	250	100	11.3	11.3
Jersey	Lime sulfur	150	0	0	0
Jersey	None	150	90	0.1	0.09
Jersey	None	300	95	0.2	0.19
Jersey	None	350	80	0.2	0.16
Jersey	None	2	0	0	0
Lawrence	Oil and Bordeaux	550	0	0	0
Lawrence	Oil and Bordeaux	250	0	0	0
Madison	None	35	0	0	0
Madison	Not determined	200	0	0	0
Marion	Lime sulfur	325	0	0	0
Marion	None for years	18	100	22	22
Marion	Oil and Bordeaux	500	0	0	0
Marion	Probably none	19	0	0	0
Marion	Lime sulfur	650	0	0	0
Marion	Yes, unknown	80	100	21.1	21.1
Massac	Not determined	400	0	0	0
Massac	Oil only	250	0	0	0
Massac	Oil and Basic Cop	3,500	0	0	0
Massac	Lime sulfur	450	0	0	0
Massac	Not determined	600	0	0	0
Massac	None	900	100	25.6	25.6
Massac	Lime sulfur	1,100	0	0	0
Massac	Probably none	150	98	2.9	2.84
Massac	Lime sulfur	350	0	0	0
Massac	None	3	100	4.67	4.67
Massac	Lime sulfur	750	0	0	0
Perry	None	35	97	8.9	8.63
Perry	Not determined	550	0	0	0
Perry	Not determined	1,000	0	0	0
Pulaski	Not determined	1,000	1	T	T
Pulaski	Oil and Bordeaux	350	0	0	0
Pulaski	Yes, probably Bordeaux	60	100	1.7	1.7
Pulaski	None	7	100	7.9	7.9

County	Control Used	Number of Trees in Orchard	Percentage of Trees with Infection	Percentage of Leaves Infected on Diseased Trees	Average Percentage of Leaves Diseased in Orchard
Pulaski	Lime sulfur	150	44	0.3	0.13
Richland	None	4	0	0	0
St. Clair	Oil and Bordeaux	300	0	0	0
Saline	Oil and Bordeaux	40	0	0	0
Saline	Oil and Bordeaux	35	0	0	0
Saline	Oil and Bordeaux	15	0	0	0
Union	None	150	100	9.4	9.4
Union	Oil only	1,450	0	0	0
Union	None	165	100	4.8	4.8
Washington	Not determined	450	0	0	0
Washington	Not determined	200	0	0	0
Wayne	Oil only	80	30	T	T
Wayne	Oil only	30	100	4.5	4.5
Wayne	Oil only	70	100	8.9	8.9
Wayne	None	35	100	2.8	2.8
White	Not determined	50	100	53.	53.
White	Not determined	1,100	70	1.2	0.08
White	None	13	100	10.4	10.4
Williamson	Not determined	675	0	0	0
Williamson	None	200	100	2.9	2.9
Williamson	None	200	100	2.35	2.35
Williamson	Oil and Bordeaux	150	0	0	0
Williamson	Oil and Bordeaux	300	0	0	0

(Illinois State Natural History Survey).

REPORTS ON APPLE SCAB

MASSACHUSETTS: In general, the weather has been moderately favorable for apple scab [Venturia inaequalis]. In spite of the seven more or less general infection periods to date (April 18-19, 29-30, May 7, 14-15, 20, 26-27, and June 2-3), most of the rains were light, of comparatively short duration, and were so spaced to allow timely spraying in most instances. The principal handicap in control was brought on by the greatly prolonged, cool blossom period, around May 1 to May 15 on such varieties as McIntosh, Baldwin, R. I. Greening, and to May 20 on later-blooming varieties. The longest and heaviest rainfall of the season and the heaviest ascospore discharge came on May 14-15, during late bloom. However, most growers had applied either the regular calyx spray or a special scab spray ahead of that infection period. Those who did not experienced marked infections. Due to the numerous showers and rains of May, the ascospore

supply in all sections of the State is being exhausted ahead of the normal time (June 15-20). At present, only a very small portion of the original supply, perhaps one percent or less, remains in the old leaves. (O. C. Boyd, Massachusetts State College, June 8).

NEW YORK: Reports in various issues of the Weekly News Letter indicate considerable infection, even in some commercial orchards.

OTHER FRUIT DISEASES REPORTED FROM NEW YORK

Peach leaf curl (Taphrina deformans) seems to be generally present according to reports in various issues of the Weekly News Letter. From Orleans County A. J. Nichols reported (June 13) that the disease is "much more serious this year than last in poorly sprayed or unsprayed orchards". J. G. Goodrich in Niagara County states (June 6) that "Leaf curl is abundant enough to call it a leaf curl year but most growers have it under excellent control".

Fire blight (Bacillus amylovorus) also seems to be appearing generally on both apples and pears. Serious injury to Rhode Island Greening was noted in several cases.

Cedar rusts (Gymnosporangium spp.) apparently have not spread much.

A little pear scab (Venturia pyrina) occurs on Bartlett pears in Niagara County according to J. G. Goodrich (June 13) who also reports brown rot (Sclerotinia fructicola) showing up on prunes. Physiological leaf drop is beginning to appear in some sour cherry orchards in Orleans County as reported by A. J. Nichols (June 13). Raspberries in Nassau County, Long Island are badly affected with mosaic according to L. Pyenson (June 13).

DOWNY MILDEW INFECTION OF TOBACCO PLANTS IN THE FIELD

[NOTE: A few other cases where infection apparently took place in the field have been reported, as follows: by R. B. McKenney during the first outbreak in 1921, on tobacco grown under shade (P.D.R. 5: 19, 1921); by E. Y. Floyd, who reported considerable injury from infection of plants about knee-high in fields in North Carolina in 1932 (P.D.R. 16: 96, 1932); and by Paul R. Miller who noticed infection in two fields where the growers had not observed the disease in the beds from which the fields were set, in Florida, 1937 (P.D.R. 21: 131, 1937).]

VIRGINIA: Downy mildew of tobacco caused by Peronospora tabacina appeared on tobacco plants in the field in the vicinity of Danville, Virginia, on June 6. Tobacco in this section was set in the fields during the first week of May. Growth has been rapid and the plants are now about 20 inches high.

Since the incubation period of the fungus is about one week, under the existing conditions, infection of field plants probably took place about June 1. The weather previous to June 1 had been consistently cloudy since May 5. Eight days of rain occurred during this period with temperatures ranging from 43° F. to 88° F. During the first week of June, some rain has fallen nearly every day and the weather has remained cloudy and cool.

Many farmers have confused the disease with wildfire and other bacterial leaf spots. The presence of the sporangia of Peronospora tabacina, while not abundant, offered positive identification of the disease. Early symptoms of the disease on plants in the field are of a leaf spot character and quite different from those on young plants in the seed bed. As the plants in the seed bed mature, the symptoms become very similar to those in the field.

Downy mildew is widespread in the fields of southwestern Pittsylvania County, although the damage is slight at the present time. (J. A. Pinckard, June 9, Tobacco Experiment Station, Chatham).

NORTH CAROLINA: Downy mildew was general in tobacco plant beds in the Burley belt of North Carolina this year; but, as was the case in the flue-cured belts, it caused only mild injury to plants and did not seriously delay transplanting.

During the period from about June 1 to June 11 downy mildew appeared on tobacco in the fields in the Old Belt and in the Burley Belt of North Carolina. The presence of sporangia of Peronospora tabacina was considered as positive identification of the disease. Symptoms of the disease on tobacco in the field have some resemblance to those on plants in the bed, but frequently resemble those produced by wildfire and blackfire.

Cool moist weather prevailed in the Old and Burley Belts of North Carolina during late May and early June; and it is assumed that these conditions are largely reponsible for the current outbreak of the disease. Damage from the disease is slight to date. (Luther Shaw, June 11, North Carolina Extension Service).

TOBACCO DISEASES IN MASSACHUSETTS

O. C. Boyd

Downy mildew: Since the last report on this disease, (May 17, P.D.R. 22: 181.), it has appeared in a few scattered beds but has not proved destructive in any of them. County Agent W. T. Locke of Hampden County reported on June 6 a slight increase in the towns of Southwick and Agawam. Some growers have sprayed the beds regularly with the special cuprous oxide preparation. Others waited until the disease appeared in their beds and then started the benzol treatment which in most instances checked the disease completely. The disease apparently has not been general enough for one to determine the value of the spray treatment. A majority of the untreated beds, even near the Connecticut line, have not been noticeably damaged.

Only three reports of downy mildew have come in from Hampshire County and none from Franklin County. C. V. Kightlinger identified it in the town of Amherst on May 23 and again on June 4. County Agent A. S. Leland reported June 7 a case observed the preceding day by a grower in Hadley. Most of the tobacco crop was set by June 1.

Wildfire [Bacterium tabacum]: W. T. Locke of Hampden County observed wildfire in a few beds during the latter part of May. In one bed the infection was so general and heavy that he advised the grower to destroy the plants.

(Massachusetts State College, June 8).

TOBACCO PLANT BED DISEASES IN FLORIDA, 1938

W. B. Tisdale and Randall R. Kincaid

During the 1938 season, downy mildew (Peronospora tabacina Adam) was first identified on February 7. Between this date and February 22, seven beds with primary infection were found in Lafayette, Suwannee, Hamilton, and Bradford counties. All of these beds were on old sites where the disease occurred last year. In all except one, unused tobacco plants were allowed to remain on the bed until time to prepare the land for this year's bed; burning was very superficial or omitted entirely. In spite of this early primary infection, no general outbreak of downy mildew occurred in these and surrounding counties until the second week in March. By this time, most of the plants were ready for transplanting and the disease attack was generally light. Only a few cases of serious

loss of plants or delay in transplanting flue-cured tobacco were reported this year. Considerable numbers of beds were sprayed with cuprous oxide - cottonseed oil spray with various results. However, most of the growers who sprayed according to recommendations reported that the treatment was beneficial and that they were satisfied with the results.

Several cases of downy mildew were observed in cigar-wrapper tobacco beds in Gadsden County during the second week in March, including some sprayed and some not sprayed. A majority of the growers set part or all of their shade acreage before downy mildew appeared in the beds. Nearly all of the growers of a large acreage of shade tobacco sprayed their beds and were satisfied with the results, although no nonsprayed areas were left in the beds that were sprayed and the results cannot be considered conclusive.

Root-knot (Heterodera marioni (Cornu) Goodey) caused an almost total loss in a flue-cured tobacco bed in Suwannee County where sweet potatoes had been planted last year.

Chlorine injury was so severe in a flue-cured tobacco bed in Madison County that the bed was abandoned.

Damping-off symptoms were observed in a considerable number of beds this season. The damage varied from loss of few plants in local areas to more than 50 percent of the plants in a few beds observed. Rhizoctonia sp. was found in a few instances; in others the cause was not determined.

Cold injury was common in most counties and necessitated resowing some beds. Extent of damage apparently varied with location of beds and age of seedlings.

(Florida Agricultural Experiment Station).

CEREAL DISEASES IN OKLAHOMA

K. Starr Chester

The writer accompanied Dr. H. A. Edson on a survey tour of the cereal-growing areas of Oklahoma May 23 to May 28. The following observations were made:

Wheat leaf rust (Puccinia rubigo-vera tritici). Conditions were as in the report of May 1 (PDR 22: 157. 1938). In all fields throughout the area of heavy infestation the heads are small and poorly filled.

Wheat loose smut (Ustilago tritici). There was at least 1 percent in nearly all fields examined; some fields showing 5 percent by count with an average of 2.5 percent for the State.

Wheat stem rust (Puccinia graminis tritici) was present in all fields examined and abundant in many; damage about 1 percent thus far.

Oat crown rust (Puccinia coronata) was present in every field examined but damage was no more than a trace except in the southeast. The heaviest damage (10 percent) occurred in Choctaw County, diminishing to 5 percent in Coal County, 1 percent in Hughes County, 3 percent in Bryan County, and 1 percent in the vicinity of Ardmore. In Choctaw County, areas were found in which every leaf was heavily rusted, but the crop was rapidly approaching maturity.

Oat stem rust (Puccinia graminis avenae) was prevalent in the southeastern part of the State, but not in the large oat area in the north-central part. The average damage thus far is about .3 percent for the State.

Oat smuts (Ustilago avenae and U. levis) were relatively abundant in most fields throughout the State. Individual fields showed 40 percent or more by count, and in many fields the counts were 10 percent or greater. The average for the State was 7 percent of which 6 percent was loose smut. The smuts were more prevalent in the southeastern than in the north-central area.

Barley smuts (Ustilago hordei and U. nuda). Individual fields with counts of 30 to 50 percent and higher were not uncommon. The average damage for the State is about 5 percent.

Barley stem rust (Puccinia graminis) was present in barley between Oklahoma City and Stillwater, but its incidence was only a trace.

Barley leaf rust (Puccinia anomala) was present in every field and often abundant but the early maturity of the crop, much of which has already been harvested, has prevented any serious damage.

Barley leaf diseases (Helminthosporium spp.) were common in all fields, but were mainly confined to the lower leaves with little damage apparently resulting.

Rye diseases. Comparatively little rye is grown in Oklahoma. In the few fields encountered, leaf rust (Puccinia dispersa) [P. rubigo-vera secalis] was the only disease of consequence, but the rust infections were early and abundant enough to have occasioned damage of 5 percent.

Wild grasses. A number of the roadside and pasture grasses have been found heavily rusted. This was particularly true of little barley (Hordeum pusillum) infected with Uromyces hordeinus and Italian rye grass (Lolium multiflorum) infected with Puccinia coronata.

(Oklahoma Agricultural & Mechanical College, May 30).

WEATHER AND CEREAL DISEASES IN IOWA

H. C. Murphy

(June 1). A moisture deficiency of 6.59 inches at Ames, Iowa in 1937, accumulated during the last four months of the year has been alleviated by an excess precipitation of 6.43 inches during the first five months of 1938. The average temperature for January and February was above normal with precipitation slightly below normal. March and April were warm and wet. May also was wet with a total precipitation of 8.24 inches, which is 3.84 inches above normal.

The heavy rainfall and an excess of cloudy weather during April and early May resulted in much yellowing and stunting of oats in Iowa. Possibly some of this condition was due to pythiaceous fungi but lack of available nitrogen, due to leaching and water-logging, and lowered photosynthetic activity probably were the more important contributing factors. The roots of plants showing stunting and yellowing, in general, did not show disease symptoms.

Much of the yellowing and stunting in small grains that was evident during the first half of May has been overcome by a rich green color and rank growth resulting from the warmth and sunshine of the past week. All small grains have stooled profusely giving a dense stand that has largely choked out the weeds, and growth has been so rank that there is danger of lodging, particularly in the winter wheat.

Leaf rust on winter wheat was first observed at Ames on May 4. It has now developed until some of the more susceptible varieties show 40 percent infection. Most of the varieties are in the boot stage of development with only a few showing first heading. Continued favorable weather certainly will result in heavy losses due to leaf rust. Septoria and mildew [Erysiphe graminis] both are unusually prevalent on winter wheat. Mildew infection is the heaviest the writer has observed during the last decade at Ames. Certain varieties and selections such as Iowin appear to be highly resistant to the current epiphytotics of both mildew and leaf rust.

Crown rust infection under natural field conditions first was observed by D. R. Shepherd and the writer near Ellsworth, Iowa, on May 24, where it apparently had spread from an adjacent, heavily infected European buckthorn hedge, that had been cut off and piled about May 10.

(June 9). One pustule of stem rust on oats was collected by the writer on June 7 in a field of early oats growing near Ogden. This particular field was in first heading and was the earliest of any observed on a 200-mile trip through north-central Iowa. About 2 percent of smut was present in this same field. Stem rust of wheat was first collected by the writer at Ames on June 6. Only three pustules were observed and they were found in the uniform winter wheat hardiness nursery.

Local infection centers of crown rust already are well established throughout central and north-central Iowa. In most instances these infection centers can be traced directly to infected Rhamnus bushes.

Leaf rust on winter wheat is very severe throughout the State with 90 percent infection on the more susceptible varieties at Ames. The variety Iowin continues to have considerable resistance to leaf rust. Spring wheat already is heavily infected and many of the more susceptible varieties in the uniform rust nursery at Ames probably will not head because of leaf rust. Leaf rusts of barley and rye are very common but not so severe as leaf rust of wheat.

(Division of Cereal Crops and Diseases).

FUNGI FOUND ON CHESTNUT AND CHINQUAPIN IN OREGON, WASHINGTON, AND BRITISH COLUMBIA

J. L. Bedwell and Marvin E. Fowler

The following is a list of fungi which have been found on species of Castanea or Castanopsis in the Pacific Northwest, with 4 exceptions, by members of this Division:

Armillaria mellea (Vahl) Quel. Castanopsis chrysophylla (Hook.) A. deC.	Oregon (Lane Co.)
Coryneum castanicola Berk. & Curt. Castanea dentata (Marsh.) Borkh.	Oregon (Lane, Marion Co.)
Coryneum kunzei Cda. var. castaneae Sacc.[1] Castanea dentata	Oregon (Lane Co.)

[1] Reported by P. W. Miller. Plant Disease Reporter 18: 4, Feb. 1, 1934.

Cytospora sp.[2]	
Castanea mollissima Bl.	Washington (Pierce Co.)
Diplodia sp.	
Castanea sp.	Oregon (Clackamas Co.)
Dothidella castanopsidis Dearn. (*Dothidella castanicola* (Ell. & Ev.) Bonar)	
Castanopsis chrysophylla	Oregon (Jackson[3], Lane, Marion, Clackamas, Klamath Co.)
Endothia parasitica (Murr.) And. and And.	
Castanea dentata	Washington (King Co.)
C. dentata X *C. sativa* (Paragon chestnut)	Oregon (Douglas Co.)
C. sativa Mill.	Oregon (Douglas Co.), British Columbia (Agassiz)
Fenestella phaeospora Sacc.	
Castanea dentata	Washington (Clark Co.)
Fomes igniarius (L.) Gill	
Castanopsis chrysophylla	Oregon (Wasco Co.)
Fusicoccum sp.[2]	
Castanea mollissima	Oregon (Lane Co.)
Ganoderma oregonense Murr.	
Castanopsis chrysophylla	Oregon (Lane Co.)
Peniophora sanguinea (Fr.) Bres.	
Castanopsis chrysophylla	Oregon (Lane Co.)
Pezicula cinnamomea (DC.) Sacc.	
Castanopsis chrysophylla	Oregon (Lane Co.)
Polyporus versicolor (L.) Fr.	
Castanea dentata	Oregon (Clackamas Co.)
Castanopsis chrysophylla	Oregon (Josephine Co.)
Schizophyllum commune Fr.	
Castanea sativa	Oregon (Multnomah Co.)
C. dentata	Oregon (Lane Co.)

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[2] Collection of P. W. Miller, Division of Fruit and Vegetable Crops and Diseases.

[3] Reported by Anna E. Jenkins. Plant Disease Reporter 22: 68, March 1, 1938.

Stereum hirsutum (Willd.) Fr.	
Castanea dentata	Oregon (Lane Co.)
C. crenata Sieb. & Zucc.	Oregon (Lane Co.)
C. mollissima	Oregon (Lane Co.)
C. sativa hybrids and grafted trees in nut orchard.	Oregon (Lane Co.)
Castanopsis chrysophylla	Oregon (Lane Co.)
Stereum purpureum Pers.	
Castanea sp.	Oregon (Lane Co.)
Valsa coronata (Hoffm.) Fr.	
Castanopsis chrysophylla	Oregon (Lane Co.)

The present status of chestnut blight (Endothia parasitica) in this region was discussed in a previous paper4/. The other fungi listed in the present paper have been under observation sufficiently long to allow some tentative conclusions to be drawn regarding their importance. In general it can be safely said that these fungi (except Endothia parasitica, the wood-rotting forms and possibly Fusicoccum sp.) have been found attacking trees growing on poor sites or predisposed to infection because of unfavorable site or climatic conditions. At places where the affected trees have been inspected at regular intervals it was found that with the return of favorable conditions and resumption of normal vigorous growth the twig-blighting and cankering diseases were thrown off. A considerable proportion of some individual trees and even an entire tree here and there have been killed by some of these fungi following injury or in conjunction with some unfavorable growing condition. At no place, however, has any of them shown indications of being strongly parasitic, nor has any comparatively great damage been caused by these organisms. Observations will be continued and any unusual cases found or reported will be investigated.

(Division of Forest Pathology, Bureau of Plant Industry).

DISEASES OF ORNAMENTAL SHRUBS IN OREGON

J. A. Milbrath

A severe outbreak of powdery mildew, Oidium leucoconium (Sphaerotheca pannosa), has recently been observed on Photinia serrulata Lindl. in western Oregon. The young terminal leaves are covered with dense

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4/ Bedwell, J. L. The present status of chestnut blight in the Pacific Northwest. Plant Disease Reporter 22: 66-68, March 1, 1938.

patches of mycelium and tufts of conidiophores. The leaves and shoots are reduced to one-half their normal size. Although abundant spores of the Oidium stage have been found no perithecia have been observed on the specimens.

Baldacci reported Oidium leucoconium on Photinia serrulata Lindl. in Italy. (R. A. M. 16:538. 1937). The present record of the Oregon occurrence seems to be the first report of this fungus on Photinia in the United States[1/].

Recently, McWhorter (P. D. R. 22:51, 1938) reported an over-abundant growth of the telial stage of the common Cumminsiella sanguinea rust of Mahonia aquifolium in Oregon. This initial abundance of inoculum favored by a very mild winter, has caused a noticeable amount of infection on the young succulent spring foliage. The spore stages produced by this infection are of the pycnial and aecial types characteristic of the genus Cumminsiella. This is of special interest because these stages seldom occur in the Northwest. Arthur (Manual of the Rusts in U. S. and Canada, page 75. 1934) states that the aecia have not been reported from America.

(Oregon Agricultural Experiment Station, June 10).

BRIEF NOTES ON PLANT DISEASES

BACTERIAL WILT OF SWEET CORN IN NEW YORK: Bacterial wilt [Aplanobacter stewarti] has appeared to a limited extent in different parts of Nassau County, Long Island. (Orson S. Cannon, Weekly News Letter, June 13).

BACTERIAL WILT ON DENT CORN IN VIRGINIA: J. R. Lintner, county agent, Leesburg, has written June 13 that an 8-acre field of Reid's Yellow Dent corn was so severely infected with bacterial wilt that the field was replanted. (Charlotte Elliott, Division of Cereal Crops and Diseases, June 16).

LEAF BLISTER OF OAK IN GEORGIA: A large number of water oaks have been observed severely affected by oak leaf blister, Taphrina coerulescens. Specimens were received from two large trees in Dodge County. When the trees were examined it was found that they had already lost about 20 percent of their leaves. Practically all of the rest were either brown or badly blistered. (S. B. Fenne, Georgia Extension Service, May).

1/ [Cecil E. Yarwood reported a powdery mildew with conidiophores of the Podosphaera leucotricha type but no perithecia on Photinia glabra and P. serrulata from California (P.D.R. 21: 182, June 1, 1937). There is no other record of a powdery mildew on Photinia in this country in the Survey files.]

SYCAMORE ANTHRACNOSE IN NEBRASKA: Anthracnose [Gnomonia veneta] of sycamore is unusually severe this year, causing 50 to 75 percent defoliation of most of the sycamores around Lincoln. (R. W. Goss, Nebraska Agricultural Experiment Station, May 31).

DUTCH ELM DISEASE ERADICATION: In New Jersey definite wilting of foliage was observed on May 20, 1938, in Somerset County. This was ten days in advance of the first definite report of an elm tree exhibiting wilting typical of Dutch elm disease symptoms at Green Village, Morris County on May 30, 1937.

Of the seventeen confirmations found in New York State during the week ending May 14, 1938, one was located in Hamptonburgh, Orange County, which is the first for this township; thereby throwing a new township into the infected zone and extending the infected area by 26.3 square miles. The tree was approximately two miles west of a 1937 Blooming Grove confirmation and is located near the town of Girard.

During the period 25 trees were confirmed, of which 12 were in Connecticut, 12 in New Jersey, and 1 in Indianapolis. Total trees confirmed up to June 4, include 367 in Connecticut, 20,088 in New Jersey, 7,872 in New York, and 119 outside, making a total of 28,446 confirmed trees. (From Bureau of Entomology and Plant Quarantine reports for weeks ending May 21 to June 4 inclusive).

LITERATURE NOTES

SOIL CONDITIONS AND THE ROOT-INFECTING FUNGI is the title of a comprehensive review by S. D. Garrett (Biol. Rev. Cambridge Phil. Soc. 13: 159-185. No. 2. April 1938).

LOSSES CAUSED BY PLANT DISEASES. Potentialities of loss in merchantable stands of western white pine exposed to blister rust (Cronartium ribicola) infection are indicated by the combined results of studies in infected areas in British Columbia and Idaho, discussed by T. S. Buchanan (Buchanan, T. S. Blister rust damage to merchantable western white pine. Jour. For. 36: 321-328. Mar. 1938).

W. A. R. Dillon Weston reports "A field observation on Ophiobolus graminis" (Ann. Biol. 25: 209-210. Feb. 1938), the pertinent feature of which is the comparison in yield between two halves of the field--of barley--one-half of which was infected with Ophiobolus and the other half not. Among other details concerning the field it is stated that in the preceding year it had been planted half in wheat and half in oats. "In 1936, in the barley which followed that half of the field taken with wheat, 60% approximately of the tillers showed infection with Ophiobolus

and 5% had been attacked by the Hessian fly. These facts were reflected in the yield, since the barley after the wheat was assessed at half a sack to the acre, whereas, after the oats, it was estimated as yielding between 6 and 7 sacks to the acre."

SPRING OF 1938 WARMER AND WETTER THAN NORMAL

(From the Weekly Weather and Crop Bulletin for the week ending June 7).

The outstanding features of the weather for the spring of 1938 were the abundant widespread rains and temperatures ranging generally above normal. It was a warm, wet spring when the country as a whole is considered. The spring of 1937 had deficient rainfall in most sections, especially in the Great Plains where the amounts were only about half the normal in considerable areas. However, the spring season of this year had heavy rains over nearly the entire country, exceptions being a few areas along the southern border, the extreme Northeast, and locally in the far Northwest. See Figure 1.

Over the Great Plains where droughts have been frequent for a good many years, the rainfall this year ranged generally from 2 to 3 times that for last year. The season was especially wet in the upper Mississippi Valley and southern Great Plains, while west of the Rocky Mountains rainfall was far above normal in most sections. One outstanding feature, however, was the severe drought in Florida which caused extensive damage to citrus fruit and truck crops, but the drought was broken by heavy rains the latter part of May.

While there were a few abnormally cold spells this spring with considerable frost damage over wide areas, the general tendency was to warmer-than-normal weather, the temperature averaging above normal throughout practically the entire country.

May was unusual for its uniform, moderate warmth. The average temperatures at first-order Weather Bureau stations were within 1° of normal, ranging from about 1° above to 1° below, in all areas, except a few isolated cases. It is very rare indeed for a month to show such uniformly normal average temperatures as May 1938. That month had above normal rainfall in most sections, especially in the Atlantic area, the Central Valleys, and the Great Plains. See Figure 2.

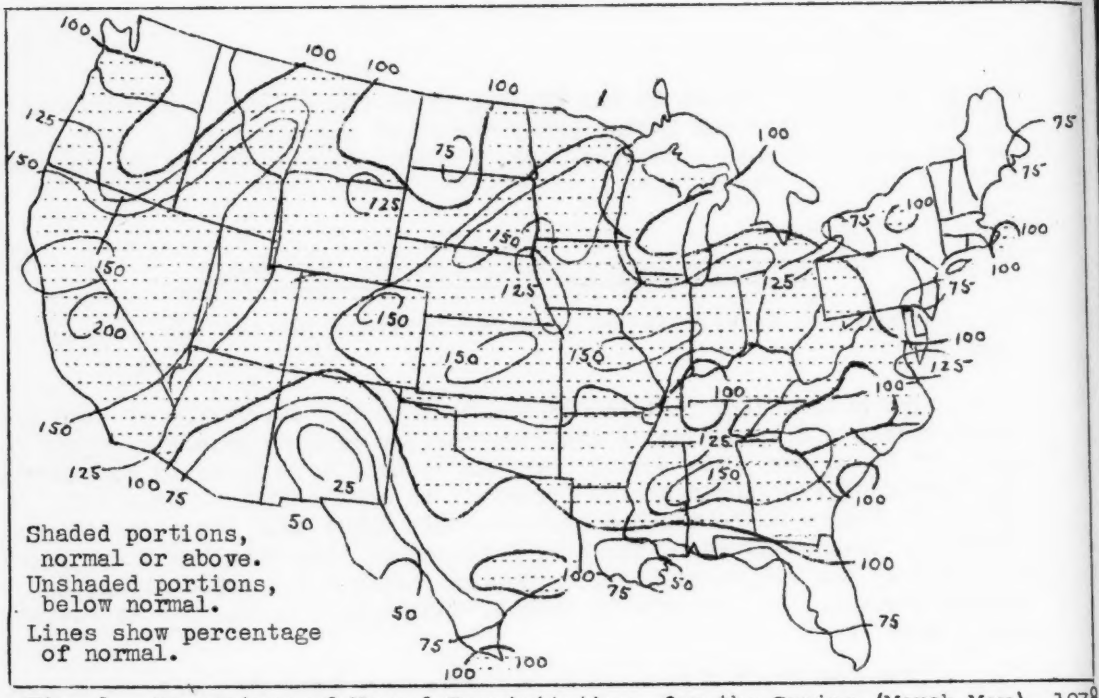

Fig. 1. Percentage of Normal Precipitation, for the Spring (March-May), 1938.

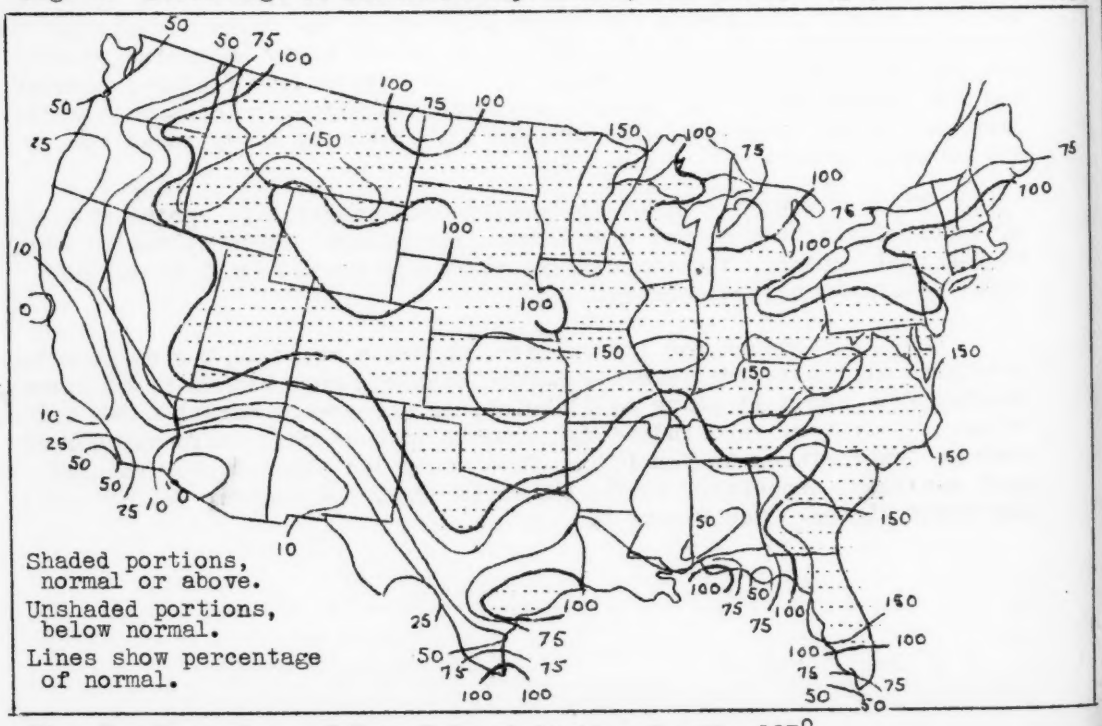

Fig. 2. Percentage of Normal Precipitation for May 1938.

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